TABLE 4. PERCENTAGE CHANGES IN ACTUAL VERSUS PLANNED COSTS PER UNIT FOR SELECTED MAJOR WEAPONS

	1981-1985 a/	1983-1985 b/
M1 Tank	45	-8
M2/3 Fighting Vehicle	64	-1
AH-64 Attack Helicopter	36	-18
CG-47 Cruiser	10	-9
Trident Submarine	9	5
F/A-18 Fighter/Attack Aircraft	58	2
F-15 Fighter Aircraft	23	25
F-16 Fighter Aircraft	24	-3
DDG-51 Destroyer	c/	-24
B-1 Bomber	c/	-9
C-5B Transport Aircraft	c/	25
MX Missile	c/	74 d/

SOURCE: Congressional Budget Office from Department of Defense data presented in support of the DoD budget requests for fiscal years 1981, 1983, and 1985.

a. Percentages reflect unanticipated growth in actual cost per unit (adjusted to 1985 dollars) versus planned costs per unit in the fiscal year 1981 budget.

b. Percentages reflect growth or decline in actual cost per unit (adjusted to 1985 dollars) versus planned costs per unit in the fiscal year 1983 budget.

c. New programs not included in fiscal year 1981 budget plan.

d. In some cases, such as the MX missile, the increase in unit cost was associated with significant reductions in the rate of production, and was thus predictable. In other cases, such as the F-16, improvements in the weapon provide a partial explanation for the increase in costs.

was drawn from Category IV, the lowest acceptable test score group among those taking the Armed Forces Qualification Test. In 1984, only 10 percent of enlistees scored in Category IV; this was the Army's goal and was well below Congressionally imposed maximums (20 percent) and draft-era averages (also about 20 percent). Moreover, in 1984 nine out of ten Army recruits were high school graduates, again far exceeding the Congressional minimum (65 percent) and draft-era averages (70 percent to 75 percent).

The experience level in the services is also rising as a result of an increase in reenlistment rates. In 1984, over 50 percent of eligible enlisted personnel reenlisted after their first term (usually the first three or four years of service) and 80 percent after their second or successive term of service. These values are much higher than 1980 levels when 39 percent of first-term personnel and 71 percent of career personnel reenlisted. As a result of these high reenlistment rates, the size of the career forces (defined as those with more than four years' service) are much larger. In 1980, career enlisted personnel numbered about 736,000, about 42 percent of all active-duty enlisted personnel. By 1984, career enlisted personnel numbered 877,000, accounting for 48 percent of all active-duty enlisted personnel.

The 1981-1982 recession certainly helped improve recruiting and retention in all the services. The high levels of unemployment that influenced personnel to join and remain in the military have since declined somewhat; yet recruiting and retention rates, while falling off slightly from the high levels of 1983, remain good by historical standards. Rather than simply reflecting a poor civilian job market, these improvements reflect the substantial increases in pay granted in 1980 and 1981 as well as important changes in personnel policies aimed at improving recruiting and retention.

Training Readiness

In addition to personnel quality and experience, training also influences readiness. Training readiness indicates whether troops have received adequate instruction and practice to perform their assigned missions and to maintain proficiency in those tasks. No objective measure exists for training readiness; unit ratings are based on the commander's judgment. A quantitative analysis such as CBO's can only measure training activity.

There have been only spotty increases in various measures of training activity between 1980 and 1984. For example, Army battalion training days

are unchanged; Air Force flight crew monthly flying hours are up by 6 percent overall, but Navy flying hours are down slightly; Navy steaming days increased only 5 percent for deployed fleets and not at all for nondeployed fleets. (Table A-4 in Appendix A shows details.)

Nor are the services training more people in formal schools. Individual training loads (the man-years spent in formal schools) have not increased since 1980 (see Table A-4). Yet during this period, funds for training were increased by about 24 percent after adjustment for inflation. 15/

Some of the additional funds were used to improve the quality of training. The Army, for example, is sending more units to its expensive but realistic National Training Center in California. The center is the facility best equipped to simulate combat conditions. The Air Force and Navy are conducting more realistic, and perhaps more expensive, training of their pilots. Use of simulators has certainly increased, but no overall measure of this type of activity is available. These qualitative improvements may explain some or all of the cost increases in training.

Equipment on Hand

Equipment and supplies on hand is a measure of the extent to which units have been provided the necessary equipment to perform their missions. Specific data on equipment on hand are classified. 16/ The Department of Defense, however, has reported publicly that equipment and supplies on hand have increased for the Navy and for Marine Corps aviation units, remained stable for Marine Corps land forces, and declined for the Army and Air Force. 17/ Many of these declines are attributed to changes in the standards used to assess this dimension of readiness. 18/ For example, as an

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15. Department of Defense, Military Manpower Training Report, fiscal years 1982 and 1984; and Department of Defense, Force Readiness Report, vol. 4, Military Manpower Training Report, fiscal years 1985 and 1986.

16. See the classified appendix to Department of Defense, Improvements in U.S. Warfighting Capability.

17. Ibid., p. 8.

18. Ibid., pp. 101-116.

Army unit begins to receive the new M1 tank, its equipment requirements are immediately revised to reflect the parts and supplies needed to support the new equipment. Thus its rating for equipment on hand may fall until all the M1 tanks and associated support items have been received.

Equipment Readiness

Equipment readiness can be measured at least in part by the percentage of equipment that is "mission capable." For aircraft, mission capable means that the aircraft can fly and perform at least one of its assigned missions. The measure has analogous meanings for other weapons.

Overall, the Department of Defense has characterized mission capable rates between 1980 and 1984 as "steady or slightly increasing." 19/ In many cases, the rates are near the goals set by the services, but rates for some types of forces have shown greater improvement (see Table 5). This is especially true for some types of aircraft, which are harder and more expensive to maintain at high mission capable rates. For example, mission capable rates for fighter/attack aircraft have risen from 53 percent to 63 percent in the Navy and from 62 percent to 73 percent in the Air Force.

Moreover, while projections are not available, there may be some further improvements based on funds already appropriated. Mission capable rates depend in part on the availability of spare parts to fix equipment. After money is authorized for spare parts, it takes one to two years before the parts are actually available at operating bases. Thus, over the next several years, further improvements should occur based on money spent to date.

These measures suggest some improvements in equipment and training readiness. But these improvements are not dramatic, especially in light of the 34 percent increase in funding in the operation and maintenance account, which pays for many activities related to training and equipment readiness, large increases in funding for spare parts, and more experienced personnel. In general, the increased funding for readiness does not appear to have resulted in proportional improvements in readiness measures.

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19. Ibid., p. 7.

SUSTAINABILITY

Sustainability, the fourth of DoD's indicators of capability, measures the ability to continue to fight effectively after the initial outbreak of hostilities. Two prime indicators of sustainability are the level of stockage of munitions and the level of other items for which war reserves are kept, compared with requirements set by the services.

TABLE 5. MISSION CAPABLE RATES FOR EQUIPMENT

	Percentage Mission Capable		
	1980	1984	Goal
Army (Fully mission capable)			
Aircraft	66	71	75
Artillery	88	89	90
Missiles	91	94	90
Tanks	86	87	90
Navy (Mission capable) a/			
Fighter/attack aircraft	53	63	68
Total aircraft	59	70	73
Marine Corps (Land--fully mission capable)			
Artillery	88	89	85
Missiles	94	86	85
Tanks	86	87	85
Air Force (Mission capable)			
Fighter/attack aircraft	62	73	74
Total aircraft	66	71	75

SOURCE: Testimony of Assistant Secretary of Defense Lawrence J. Korb before the Subcommittee on Preparedness, Senate Armed Services Committee (February 21, 1985).

a. Includes Marine Corps aircraft.

Requirements for war reserves of munitions are inevitably highly uncertain, because they are based on the assumed nature and length of future wars. CBO cannot verify the validity of these requirements. Nonetheless, the services' requirements presented here are the only available measures, and they permit a relative assessment of DoD's position in 1980 and today.

Munitions

Munitions include bombs, ammunition of all types, and most tactical missiles. War reserve stocks of munitions provide replenishments for forces, once the basic issue they carry with them has been exhausted. The DoD has spent substantial sums on war reserves. In nominal dollars, funding between 1981 and 1985 totaled almost $46 billion (see Table 6). This funding has increased reserves of munitions significantly. The Army, for instance, has gone from 65 percent to 77 percent of its requirements. The other services also show improvements. (Each of the services measures its overall war reserve position in different ways; thus, interservice comparisons would be misleading.) Major gaps still exist, however, between what the services have and what they say they need.

Secondary Items

Secondary items are the roughly 4 million items, other than weapons systems and munitions, that DoD buys. Of these, some 200,000 items have been deemed sufficiently important to warfighting ability that war reserve objectives have been set for them. These items include spare parts for weapons systems, clothing, food, fuel, and medical supplies. War reserve stocks are maintained both in potential combat theaters--such as Europe, the Pacific, and the Indian Ocean--and in the continental United States. As with munitions, service estimates of the requirements for secondary items have increased considerably over the past five years. Though highly uncertain, the service estimates used here are the only available systematic statement of requirements.

Expressed as a percentage of requirements, stocks of secondary items have actually deteriorated slightly since 1980 for all services except the Air Force. From 1980 to 1985, war reserve stocks increased in value by 106 percent, measured in nominal dollars, but objectives increased by 118 percent (Table 7). These increases in objectives do not result from changing assumptions regarding the scope or length of a future war. Rather,

TABLE 6. WAR RESERVE STOCKS OF MUNITIONS a/

	Percent of Objective		Funding 1981-1985 b/ (Millions of dollars)	Cost to Meet Objective (Millions of dollars)	Years to Meet Objective c/
	1980	1984			
Army	65	77	19,109	15,400	3
Navy d/	12	22	12,082	25,400	7
Marine Corps e/	32	44	2,764	3,800	5
Air Force	21	30	11,838	25,800	9
Total	N/A	N/A	45,793	70,400	6

SOURCES: Congressional Budget Office from data in Department of Defense, Improvements in War Fighting Capability, FY 1980-84 (May 1984), and testimony of DoD officials.

NOTE: N/A = not applicable.

a. Munitions include ammunition, bombs, and most tactical missiles (as well as spares for the latter).

b. Fiscal year 1985 request.

c. At fiscal year 1985 spending rates.

d. Includes Marine Corps air munitions.

e. Land forces only.

TABLE 7. WAR RESERVE STOCKS OF SECONDARY ITEMS
(Millions of dollars)

	Army	Navy	Air Force	Marine Corps	Total
1980					
Assets	2,600	450	1,300	95	4,445
Objective	6,000	930	4,100	160	11,190
Percent fill	43	48	32	60	40
1985					
Assets	3,181	732	5,035	192	9,140
Objective	13,286	1,944	8,761	455	24,446
Percent fill	24	38	57	42	37
1980-1985 Percent Changes					
Assets	22	63	287	102	106
Objective	121	109	117	184	118

SOURCE: Congressional Budget Office from Department of Defense data.

NOTE: Secondary items include clothing, fuel, rations, spare parts, medical supplies, and others deemed by the services as critical to a war effort.

statements by DoD and the services suggest that increases stem from the advent of new weapons that require much more expensive spare parts, which increases the cost of sustaining them in combat. 20/ Indeed, this may be one of the less visible ways in which more complex weapons add to DoD costs. Moreover, new weapons systems sometimes need new items of accessory equipment (for instance, the new table of equipment and organization calls for M1 tank drivers to be equipped with goggles for night vision). Since many of these items are in their initial procurement cycle and are still being used to equip units, there has not been time (or money) to build up war reserves.

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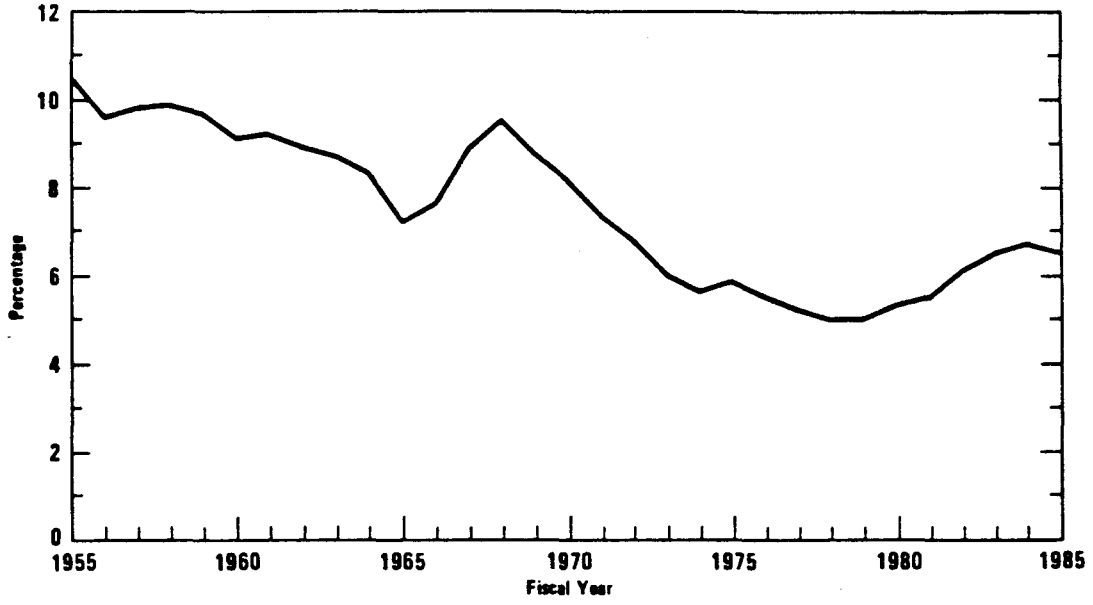
20. Ibid., p. 111.

APPENDIX A. SUPPLEMENTARY FIGURES AND TABLES

Figure A-1.

Defense Outlays as a Share of GNP



SOURCE: Congressional Budget Office from Department of Defense data.

TABLE A-1. HISTORICAL DISTRIBUTION OF DEFENSE SPENDING (In percent)

	1955	1960	1965	1970	1975	1980	1985
Investment	33	46	44	35	32	36	47
Military Pay	38	28	30	35	36	30	24
Operation and Other Support	30	26	27	30	32	34	29

SOURCE: Congressional Budget Office from Department of Defense data.

NOTE: Investment = Appropriations for procurement; research, development, test, and evaluation; and military construction.

Military Pay = Appropriations for military personnel and retired pay.

Operation and Other Support = Appropriations for operation and maintenance, family housing, and revolving funds.

TABLE A-2. PROCUREMENT CHANGES SINCE THE FISCAL YEAR 1981 BUDGET SUBMISSION

	Planned 1981-1985 Program (In fiscal year 1981 Budget)			Actual 1981-1985 Program			Percentage Change		
	Quantity (Units)	Funding (In millions of 1985 dollars)	Cost per Unit	Quantity (Units)	Funding (In millions of 1985 dollars)	Cost per Unit	Quantity	Funding	Cost per Unit
M1 Tank	3,891	6,332	1.63	3,804	8,966	2.36	-2	42	45
M2/3 Fighting Vehicle	3,720	3,591	0.97	2,855	4,522	1.58	-23	26	64
AH-64 Attack Helicopter	284	2,615	9.21	315	3,955	12.56	11	51	36
CG-47 AEGIS Cruiser	16	16,210	1,013.15	14	15,656	1,118.26	-13	-3	10
SSBN Trident Submarine	6	9,445	1,574.20	4	6,876	1,718.88	-33	-27	9
F/A-18 Fighter Aircraft	656	13,692	20.87	375	12,387	33.03	-43	-10	58
F-15 Fighter Aircraft	90	2,764	30.71	195	7,379	37.84	117	167	23
F-16 Fighter Aircraft	660	8,717	13.21	714	11,713	16.41	8	34	24

SOURCE: Congressional Budget Office from Department of Defense budget justification data (various fiscal years).

TABLE A-3. PROCUREMENT UNIT COST CHANGES SINCE THE FISCAL YEAR 1983 BUDGET SUBMISSION

	Planned 1983-1985 Program (In fiscal year 1983 Budget)			Actual 1983-1985 Program			Percentage Change		
	Quantity (Units)	Funding (In millions of 1985 dollars)	Cost per Unit	Quantity (Units)	Funding (In millions of 1985 dollars)	Cost per Unit	Quantity	Funding	Cost per Unit
M1 Tank	2,936	6,969	2.37	2,535	5,556	2.19	-14	-20	-8
M2/3 Fighting Vehicle	1,930	2,919	1.51	1,855	2,770	1.49	-4	-5	-1
AH-64 Attack Helicopter	269	3,650	13.57	304	3,374	11.10	13	-8	-18
CG-47 AEGIS Cruiser	9	10,556	1,172.89	9	9,559	1,062.08	0	-9	-9
SSBN Trident Submarine	4	6,808	1,701.92	3	5,340	1,780.00	-25	-22	5
F/A-18 Fighter Aircraft	288	8,604	29.187	252	7,689	30.51	-13	-11	2
F-15 Fighter Aircraft	198	6,653	33.60	117	4,910	41.96	-41	-26	25
F-16 Fighter Aircraft	360	6,861	19.06	414	7,626	18.42	15	11	-3
New Programs (not included in 1981-1985 Five-Year Defense Plan)									
DDG-51 Destroyer	1	1,486	1,486.00	1	1,129	1,129.00	0	-24	-24
B-1 Bomber	53	17,404	328.38	51	15,246	298.94	-4	-12	-9
C-5B Transport	24	5,212	217.16	13	3,526	271.23	-46	-32	25
MX Missile	118	7,362	62.39	42	4,550	108.33	-64	-38	74

SOURCE: Congressional Budget Office from Department of Defense budget justification data (various fiscal years).

TABLE A-4. MEASURES OF MILITARY TRAINING ACTIVITY

	1980	1982	1984
Individual Training loads (In thousands of man-years)			
Army	78	76	70
Navy	58	64	64
Marine Corps	19	19	21
Air Force	42	44	41
Reserve components	28	38	32
Total DoD	236	241	228
Training Funding (In billions of 1985 dollars)	11.1	12.6	13.8
Collective Unit Training			
Annual training days per battalion			
Army	N/A	161.7	161.9
Marine Corps	N/A	95.2	100.5
Flying hours per crew per month			
Army	18.8	17.2	16.4
Navy and Marine Corps	24.2	23.7	23.7
Air Force	20.2	21.4	21.5
Air Force tactical aircraft	15.6	N/A	19.3
Steaming days per quarter			
Deployed fleets	57	58	60
Nondeployed fleets	29	29	28

SOURCE: Data for 1980 and 1982 from Department of Defense, Military Manpower Training Report, fiscal years 1982 and 1984. Data for 1984 from Department of Defense, Force Readiness Report, vol. 4, Military Manpower Training Report, fiscal year 1986.

NOTE: N/A = not available.

APPENDIX B. STATUS OF MODERNIZATION PROGRAM

Table B-1 shows the status of the acquisition programs for certain key weapons systems central to DoD's modernization efforts. The first column of the table shows the total acquisition objective for the system (that is, the ultimate number of weapons the service intends to buy). The second column shows the cumulative number authorized by the Congress through fiscal year 1985, and the third column expresses this as a percentage of the objective. Thus, the Army has, to date, been authorized to acquire 4,223 M1 tanks--60 percent of its total objective of 7,058.

The final column shows the percentage of all weapons in the appropriate class that are "modern." Since there is no single accepted definition of a modern weapon, CBO tailored the definitions used to fit each class of weapons system. The definitions used appear below:

- Tanks--M1 and M60A3 tanks as a percentage of all Army tanks.
- Fighting vehicles--M2 and M3 fighting vehicles as a percentage of all IFVs, CFVs, M-551s, and the family of vehicles derived from the M-113 APC.
- Attack helicopters--AH-64s as a percentage of all attack helicopters.
- Utility helicopters--UH-60s as a percentage of Army utility helicopters.
- Cruisers--ships less than 15 years old as a percentage of all cruisers.
- Landing ships--LHA-1 and LSD-41 class ships as a percentage of all landing ships.
- Strategic submarines--Trident as well as earlier class ships equipped with the C-4 Trident missile as a percentage of all strategic submarines. (Each Trident sub is counted as 1.5 ships to reflect the increase in missiles from 16 to 24.)

- Navy tactical aircraft--F-14s and F/A-18s as a percentage of all fighter and attack aircraft.

- Strategic bombers--B-1s as a percentage of all strategic bombers.

- Air Force tactical aircraft--F-15s and F-16s as a percentage of all fighter and attack aircraft.

- Strategic airlift aircraft--C-5s as a percentage of all strategic airlift aircraft (C-5s and C-141s).

- Tanker aircraft--KC-10s and re-engined KC-135s as a percentage of all tankers.

- Land-based strategic forces--MX missiles and Minuteman missiles equipped with the MK-12A warhead as a percentage of all land-based missiles.

TABLE B-1. ACQUISITION OBJECTIVES AND AUTHORIZATIONS FOR SELECTED SYSTEMS

	Total Acquisition Objective	Authorized Through 1985		Percent Modern (As of 1985 FDP) a/
		Number	Percent of Objective	
Army				
M1 tank	7,058	4,223	60	67
Bradley fighting vehicle	6,882	2,955	43	10
AH-64 helicopter	515	315	61	23
UH-60 helicopter	1,107	689	62	19
Navy/Marine Corps				
AEGIS cruiser	27	16	59	47
LSD-41	8	6	75	18
Trident submarine	(20) b/	12	60	56
F-14	899	557	62	47
F/A-18	1,377	409	30	
Air Force				
B-1 bomber	100	52	52	14
F-15 fighter	1,356	834	62	45
F-16 fighter	2,651	1,139	43	
C-5B transport	50	13	26	25
KC-10 tanker	60	42	70	40
MX missile	100	42	42	52

SOURCE: Congressional Budget Office from Department of Defense data.

a. "FDP" refers to Funded Delivery Period, the time when all weapons authorized by 1985 are built and in the inventory.

b. Unofficial estimate of objective.

APPENDIX C. PROGRAM COST CALCULATION

Appendix A presents estimates of unit cost for selected weapons systems included in the 1981-1985 DoD procurement program. These estimates were derived as follows:

1. Express planned funding (budget authority) in the 1981-1985 Five-Year Defense Plan in constant 1981 dollars by deflating, using the anticipated inflation factors used by DoD in 1980.

2. Inflate the sum over 1981-1985 to 1985 dollars using actual DoD inflation rates for major systems total obligational authority (TOA).

3. Divide the result by the planned acquisition quantity over 1981-1985 to derive planned unit cost (in 1985 dollars).

4. Inflate actual funding for the years 1981-1985 to 1985 dollars and sum.

5. Divide by actual quantity acquired to derive actual unit cost (again, in 1985 dollars).

The same procedure was used for the 1983-1985 comparison (with 1983 substituted for 1981 everywhere in the above description).